Mimulus Memo

California Native Plant Society
KERN CHAPTER

MARCH 2021

CONTENTS

Mary Beal (1878-1964) - 1
Botanist of the Mojave Desert
President's Message: - 3
Appreciation - 5
Adobe House Report - 5
"I Knew That" - 6
Oak Galls: Part II -6
Bakersfield Cactus Project - 7
Upcoming Programs - 7

EVENTS

MARCH

11 – Zoom Program, 4pm

APRIL

1 – Zoom Program, 4pm
15 – Zoom Program, 1pm

Mary Beal (1878-1964), Botanist of the Mojave Desert

by Nancy Nies

PART ONE

"IF YOU SHOULD COME UPON A SMALL, *active woman in some isolated corner of the Mojave, wrapped about with photographic equipment and clinging to the canyon wall with fingers and toes while she decides whether to study a flower or investigate a mineral specimen, it will be quite safe to say: 'Hello,* ***Mary Beal.****'"*

This vivid description of an exceptional woman, written by her friend **Harold Weight**, appeared in the December 1948 issue of ***The Desert Magazine***, where he and his wife **Lucile** were staff editors.

Photo by Alison Taggart-Barone, NPS, Wikimedia Commons

Mojave National Preserve, **31 October 2017.**

So, how did a young woman from Illinois, with no formal training in botany, end up spending most of her life in the California desert, developing friendships with well-known naturalists, collecting thousands of plant specimens for the **Jepson Herbarium** at the **University of California at Berkeley**, writing a regular botany column for ***The Desert Magazine***, and leaving a legacy of desert protection?

Early Influences

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According to a booklet entitled **"The Floral World of Mary Beal,"** written in 1969 by her friend Lucile Weight, Mary moved to Riverside, California, with her family in 1900. From 1906 to 1910, she worked at the Riverside library, where she became acquainted with **John Burroughs** (1837-1921), famed naturalist and nature essayist, when she aided him with reference materials.

Mary Beal and **John Burroughs** in front of her tent home on the Van Dyke ranch in Daggett, CA, 1911

In 1910, suffering from a respiratory illness, Mary was advised by her doctor to spend some time in the desert. She then *"boldly wrote* ***John Muir****, asking for advice on her escape from civilization"* (***John Muir Newsletter***, Fall 1995). Muir recommended the **Van Dyke ranch** in **Daggett**, where Muir's daughter **Helen** was herself recovering from a lung ailment. Calling Mary Beal *"[a] pioneer botanist in an age of earnest and accomplished amateurs,"* the article goes on to say that *"she stayed for the rest of her life, dying on the ranch in her eighties."*

...she fell in love with the desert and built herself a rustic cabin.

When Mary first arrived in the rough-and-tumble town of Daggett, where her landlord was desert writer and judge **Theodore Strong Van Dyke**, she lived in a tent house. Lucile Weight writes that Mary originally intended to stay at the ranch for only 18 months, but that she fell in love with the desert and built herself a rustic cabin.

Mary was fascinated by desert plants, and taught herself botany in the evenings by the light of a kerosene lamp. Her textbooks were a dictionary and, after its publication in 1925, **Willis Jepson's** comprehensive **Manual of the Flowering Plants of California**, which was — and, now updated and called the **Jepson Manual**, still is — the standard guide to California plants.

A Life of Independence, Exploration and Discovery

An article on Mary Beal and **Minerva Hoyt**, from the **Mojave National Preserve's** website, sets the stage for Mary's life: *"The Mojave Desert in the Great Depression years of the 1930s was a desolate place —sparsely populated by miners, occasional botanists, and a few adventurers and loners."* The article points out that it would have been very unusual to find a woman living and traveling alone in such an inhospitable environment, but that Mary was irresistibly drawn to the desert and to its *"hundreds of majestic, fascinating, largely unexamined plants."*

Wikimedia Commons

Mentzelia involucrata (stick-leaf), found in the Mojave and Sonoran deserts, undated

In 2016 **Julia Sizek** wrote an article whose title alone indicates what an adventurous, independent woman Mary Beal was, particularly for her time: ***"When Women Seldom Travelled Alone, This Botanist Wandered the California Deserts in Search of Rare Plants."*** Traveling far and wide in the Mojave Desert, Mary explored a huge area including San Bernardino, Riverside and Inyo counties, writes Sizak.

Mary loved the solitude of the desert, writes Harold Weight, and enjoyed making expeditions alone or with her horse or dog. Searching for plants, Mary wandered the desert and climbed the mountains of the Mojave — the **Providence Mountains**, the **New York Mountains**, the **Ords**, and **Clark Mountain** — which Mojave National Preserve's website terms *"islands in the desert where a great variety of species can be found, and where the flowering season is extended far beyond that on the desert floor."*

Mary Beal's life was also filled with the joy of discovery, as shown by her 1941 account of encountering a memorable example of *Mentzelia involucrata* (**samija** or **stick-leaf**). She had not seen it in ten years and had begun to doubt she would ever see it again. Mary called the sighting *"a treasure-trove beyond my most wishful dreams,"* and went on to say: *"Even today I have a vivid memory of one gorgeous specimen that was truly the queen of the desert garden. Two feet high it stood, and twice as broad, with dozens of branches forming a magnificent rounding bush, a mound of lustrous silken blossoms. Surely the flowers were holding jubilee as well as I."* ✿

[*In PART TWO (June 2021 issue). . . Mary Beal's contributions to Mojave desert botany, her contributions to* ***The Desert Magazine****, and her legacy.*]

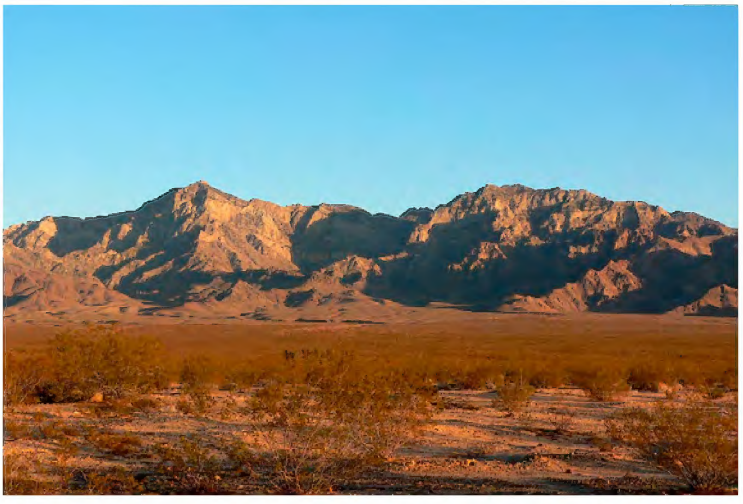


Photo by Stan Shebs, Wikimedia Commons;

Providence Mountains from the northwest, Mojave National Preserve, - **20 January 2007**

Vermilacinia zebrina, Baja California. **Left:** Thallus growing on branch in Baja California. **Right**: Close-up of thallus branches showing soralia, each a powder puff-like mass of soredia, which are a mix of fungal and algal cells that disperse together — by means of wind, insects or birds — to start a new lichen thallus, a means of asexual reproduction found in many species of lichens.

President's Message: How long do species of lichens and moss live?

by Rich Spjut

MOLECULAR CLOCK TECHNIQUES, WHICH, have been evolving for more than five decades[1], are employed to determine when species and their ancestors evolve. They generally assume constant mutation rates and look to the geological record for the nearest fossil relatives for making age correlations.

Here I will briefly elaborate on three examples:
1) a group of Pacific Coast worm lichens
2) the California state lichen
3) a species of moss first discovered in Kern County and later elsewhere.

How old are they and where did they originate?

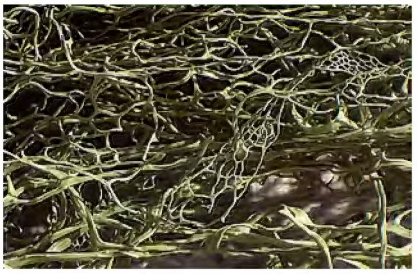
#1 – In our last ***Mimulus Memo***, I mentioned the **zebra worm-lichen**, *Vermilacinia zebrina* (Ramalinaceae) which occurs along the foggy areas of the **Pacific Coast** from British Columbia south to Baja California with a disjunct occurrence in **Namibia**. The age of the species and the story of how it made its way from our Pacific Coast to the Namib fog desert, and nowhere in between, is speculative. DNA of related South American species have yet to be studied — such as *V. tigrina* discovered by **Gerhard Follmann** (Willdnowia 4: 225, 1966) in the **Atacama Desert** of northern Chile near the foggy summit of Cerro Moreno where it was reported to grow on soil among large cacti, succulent shrubs and other lichens. The **tiger *Vermilacinia*** is most similar to the **leopard *Vermilacinia*** (*V. leopardina*), a species often covering branches of shrubs such as the semi-succulent *Euphorbia misera*, which is common along the Pacific coast of Baja California. The **leopard worm-lichen** differs by the absence of **soralia** and **depsidone** metabolites. Despite being able to distinguish them, support from DNA, including *V. zebrina*, remains unresolved.[2] They appear to have evolved from an ancestral species complex dating back perhaps eight million years ago (mya), in contrast to speciation within the genus that began around 22.4 mya near **Patagonia**. The youngest clades[3] are < 5 million mya.

Photos by Richard Spjut

Above: *Vermilacinia leopardina*, covering upper stems and leaves of *Euphorbia misera* in Baja California.
Lower left: close-up of leaves and fruit,
Lower right: thallus of *V. leopardina*

#2 – *Ramalina*, a related large cosmopolitan genus, includes the **California state lichen**, commonly known as the **lace lichen,** *R. menziesii*[4]. Based on the DNA sampled throughout much of its range — from southern Alaska to Baja California — it is recognized as having **six** eco-geographical lineages[5]. The oldest are two in Baja California, one in the coastal scrub and chaparral region, the other in the **Vizcaíno Desert**. They reportedly have been in isolation from the lineages in California and those further north for as much as 2 million years[6].

#3 – Then there is the **Shevock rock-moss**, *Orthotrichum*



Ramalina menziesii, lace lichen, the spaces in the net described by some as holes in the lichen. Specimen collected by R. Spjut and E. Sérusiaux in Baja California **Jan, 2016..**

Orthotrichum laevigatum, CNPS Kern Chapter field trip with James Shevock **Jan. 2018, Old Kern Canyon Rd.**

Orthotrichum rupestre. CNPS Kern Chapter field trip with Paul S. Wilson **Mar. 2017, Old Kern Canyon Rd.**

Orthtrichum bolanderi, CNPS Kern Chapter field with James Shevock **Jan. 2018, Old Kern Canyon Rd.**

shevockii, first discovered from specimens collected by **James Shevock** with **Bian Tan**, 16 Mar 1996, in Kern County along Highway 178, north base of the **Scodie Mountains**, 1.12 km east of the Chimney Peak Road[7,8]. Subsequently, it was found further north in the **Sierra Nevada** and **White Mountains** by Shevock and others, in the counties of Tulare, Fresno, Mono, Calaveras and Washoe NV. (CNABH).

However, recently bryologists have taken it much further in its distribution. Taxonomic studies on *Orthotrichum* published in 2019 — based on "*morphological analyses, phylogenetic inferences, molecular dating and estimation of ancestral ranges*" — led to a much broader interpretation of the Shevock rock-moss as a result of investigating similar Orthotrichums in the **Canary Islands**[10]. **Vigalondo et al.**, which includes Shevock (2019), identified specimens recently collected on **Tenerife Island** to be the Shevock rock-moss. Additionally, a related rare California species, *Orthotrichum kellmanii* (1B.2, **Kellman's bristle moss**), known only from relatively few places in the Central Coast Ranges, sandstone ridges in dense chaparral, in Monterrey, Santa Cruz, San Mateo counties, was no longer a species, despite being described by Norris, Shevock and Goffinet in 2004, who had distinguished it by its vegetative stems and leaves being different from those of reproductive shoots, and for its creepy habit (growing ± flat to the surface).[11] Since *O. shevockii* is the earlier name, it has priority over *O. kellmanii*, which then became a synonym of *O. shevockii*. Vigalondo et al. further concluded that the Shevock moss originated in California and 'flew air express' (dispersed by spores) to Tenerife Island sometime between 2.75 and 1.75 mya. Another *California Orthotrichum*, *O. norrisii*, has a close sister relationship to *O. tenellum*, a Mediterranean-Macaronesian species that is suggested to be the result of similar recent transatlantic dispersal[12]; nevertheless, they would seem to date back further in time than *O. shevockii*, because after all both retained their species status.

Of additional interest, while not directly related to the topic, is the rare **Spjut's bristle moss** (*O. spjutii*, 1B.3), which since its discovery in 1993, was transferred in 2016 to a new genus, *Lewinskya*. It was collected by **Dan Norris** in the northern Sierra Nevada in the **Stanislaus National Forest** near **Leavitt Lake** where he hiked after directing **Jaakko Koponen** and me to an abundance of *Syntrichia* and *Homalothecium* mosses that we collected on 22 July 1980 near the base camp (**Frazer Flat Campground**) for antitumor screening.[13] The type locality was visited by James Shevock this past summer, July 4. Shown in the ***California Academy of Sciences Botany News*** #3 (July 20, 2020) is a photo of a waterfall over a natural dam of vertical rocks where he saw Spjut's bristle moss on the nearby rock walls. "*It was moss heaven*," James wrote. The bristle moss has since been reported in the **Domeland Wilderness** in Tulare County, central Nevada, and as far north as Modoc County, the latter based on specimen collected by **Eve Laeger** with **Cheryl Beyer** in Aug 2005. Our members may recall she attended our 2018 annual potluck in which James Shevock gave a presentation on bryophytes. In our Checklist of Kern County Bryophtyes, she is cited for 155 specimens collected in Kern County in which 187 species were recorded.✿

ENDNOTES

i M dos Reis, M., Donoghue, P. & Z. Yang. 2016. Bayesian molecular clock dating of species divergences in the genomics era. Nat Rev Genet 17, 71–80. https://doi.org/10.1038/nrg.2015.8.

ii R W Spjut, A Simon, M Guissard, N Magain, and E Sérusiaux.2020. The fruticose genera in the Ramalinaceae (Ascomycota, Lecanoromycetes): their diversity and evolutionary history. MycoKeys 73: 1–68 & supplements.

iii Clade: From Ancient Greek: klados, "branch." A group of organisms believed to have evolved from a common ancestor, according to the principles of cladistics., e.g., "the great ape and human clade"

iv *Ramalina menziesii*, California State Lichen. Bill signed by former governor Jerry Brown, July 15, 2015, designating the lace lichen (*Ramalina menziesii*) as the California State lichen

v Lineage: as used here, a sequence of species arising from a common ancestor.

vi VL Sork, S Werth. 2014. Phylogeography of *Ramalina menziesii*,

a widely distributed lichen-forming fungus in western North America. Molecular Ecology 23(9): 2326–2339.

vii J Lewinsky-Haapasaari and DH Norris, 1998. *Orthotrichum shevockii* (Orthotrichaceae), a new moss species from the southern Sierra, California. The Bryologist 101: 435–438.

viii Bryophytes of Kern County, California. A specimen-based checklist extracted by RW Spjut from the Consortium of North American Bryophyte Herbaria website and from the California Moss eFlora. Last updated Feb 2018. On our Jan 2018 field trip, James Shevock found one more species to add to the Kern bryophyte flora, *Crummia latifolia*.

ix CNABH. Consortium of North American Bryophyte Herbaria, accessed Feb 17, 2021.

x Vigalondo B, Patiño J, Draper I, Mazimpaka V, Shevock JR, Losada-Lima A, et al. 2019. The long journey of *Orthotrichum shevockii* (Orthotrichaceae, Bryopsida): From California to Macaronesia. PLoS ONE 14(2): e0211017. https://doi.org/10.1371/journal.pone.0211017

xi Vitt, D. H. in FNA 28: 37, 45, 57 (2015).

xii R Medina, F Lara, B Goffinet, R Garilleti, V Mazimpaka. 2013. Unnoticed diversity within the disjunct moss *Orthotrichum tenellum* s.l. validated by morphological and molecular approaches. Taxon 62: 1133-1152.

xiii RW Spjut, M Suffness, GM Cragg and DH. Norris. 1986. Mosses, liverworts and hornworts screened for antitumor agents. Economic Botany 40: 310-338

ADOBE HOUSE UPDATE

by Don Turkal

THE UPDATED TIMELINE FROM **GEOFFREY Hill**, Kern County Chief General Services Officer:

> We will have the construction documents submitted to **Kern County Building Inspection Division** for their plan review and permit issuance. We anticipate eight weeks for their review. We are also submitting the construction documents to **Community Development** for their review and comment. We anticipate being out to bid in late March. We anticipate issuing the construction contract in May with the project construction taking approximately three months to complete. We are discussing the operating agreement with **Kern River Parkway Foundation** and will be continuing discussion until we have the agreement in place prior to the construction being completed. We've come a long way and still have hurdles to jump, but we are diligently pursuing success.

Bill Cooper has asked **Kern CNPS** and other constituent groups to be thinking about what level of participation they will be willing to commit to on this important project. I have listed a few of Bill's thoughts on his vision for the future of the Adobe House.

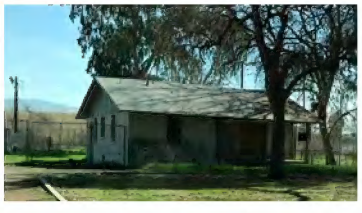


Photo by Don Turkal

The Adobe House today.

- A great opportunity for environmental education
- An education center primarily for school-aged children
- A way to educate the public regarding the parkway and the Kern River (both cultural and natural)
- Displays and presentations inside the building and an outdoor area for group activities

Don feels this gives all Kern CNPS members the opportunity to decide what inside displays and what outdoor programs we could use to show, promote, and educate the public about native plants. Send your suggestions regarding any or all of the items listed by Bill Cooper ASAP to:

Richard Spjut, President Kern CNPS
P.O. Box 81145
Bakersfield, CA 93380-1145

Please include your printed **email address** or **phone number** so we can contact you with any questions regarding your suggestions. ✿

Thank You to:
... Reed Tolleffson, for relating progress on restoration on the new Hot Springs Valley Wetlands and Hanning Flat Preserves
... Paul Gipe for hosting all of our Zoom meetings during the pandemic. ✿

California Native Plant Society

CNPS is the leader for providing reliable information on California native plants and plant conservation. Comprehensive information about California's flora and vegetation communities is available throughout the state for conservation and educational purposes. CNPS's leadership influences personal ethics and actions, as well as public policy for native plant protection.

"I KNEW THAT"

by Yvonne Turkal

HERE IS OUR DISCLAIMER: THIS COLUMN IS about edible plants and the basic information comes from the book **Edible and Useful Plants of California**, by **Charlotte Bringle Clarke**, Univ. of California Press, 1977. The Kern Chapter of the California Native Plant Society isn't responsible for any of your results. Examples: Planting a suggested genus and species, watch it outgrow your expectations, or not grow at all; trying a recipe and finding it less than satisfactory or maybe getting lucky and enjoying every last morsel.

Photos courtesy WikiCommons

Western chokecherry (*Prunus virginiana* var *demissa)*

Want a plant that you can watch bloom May through June and then use the fruit in summer and fall? What about planting a **western chokecherry** (*Prunus virginiana* var. *demissa)*?

This comes in either a shrub or a small tree, so assess your available space before literally putting its roots down. Bird Alert…….They love the fruit of this shrub/tree, so you could find your western chokecherry family growing if your friendly flyers drop their fruit treasures before they reach their nest. I, on the other hand, have been warned by the book's author, **Charlotte Clarke**, not to eat wilted leaves (wasn't planning on doing that) or the fresh seeds. Seems they both contain **hydrocyanic acid**. She does go on, however, to mention that when boiled, the acidity is removed.

Now that you have accessed and purchased one of these shrub/trees and you live in a DRY climate, make sure your new arrival gets at least 15 inches of that liquid we don't see very often, water. If you happen to live with a lovely stream or water source on your property your western chokecherry will love you for planting it close by. If you don't have such a water source, you will need to improvise however you see fit so its toes can find that annual 15 inches of liquid.

Native peoples and pioneers, according to Clarke, used the chokecherries for food and medication as they did with so many other plants/trees and their leaves, fruit, and bark. Oh, and if you want to whittle your own bow and arrow, the wood of this plant works beautifully. No mention of how long it would take, but then that is a variable.

I found recipes online, and this one from Clarke, but because of the hydrocyanic acid scare I am asking you to re-read our disclaimer at the top of this newsletter before venturing forth. :)

Spiced Chokecherry Jam

3 cups **chokecherries**, pitted
2½ cups **water**
Juice and pulp of 3 **oranges** or **lemons**
1½ tsp ground **cloves**
1½ cups **honey** or 2¼ cups **sugar**
Liquid pectin

Bring to a boil the chokecherries, water, juice and pulp of oranges or lemons, cloves, and honey or sugar. Simmer for 10 minutes until sauce is clear and sugar is dissolved. Adjust taste with orange or lemon or with sugar. To every 3 cups of sauce, add one 6 oz. bottle of liquid pectin. Boil hard for 1 minute and pour into sterilized jars. Seal with melted paraffin and cover with waxed paper or use lids. Makes 8 cups. This excellent jam makes beautiful gifts.

OK, let's say this together now…."I knew that." ✿

Part II – Native Peoples/Native Plants: Oak Galls

by Sasha Honig

EVERY THIRD-GRADE TEACHER IN CALIFORNIA goes through the unit on California native peoples, so kids know all about acorns and acorn mush, but did the teacher mention oak galls?... Not likely. But he or she has missed a chance to impress those kids who just love tales of blood and gore. After all, hunters had unfortunate encounters with bears and the like, so how were they patched up when they crawled back to the village?

Photo by Sasha Honig

Oak "apples" or oak galls.

Our on-the-ball teacher could have explained that such wounds would have been cleansed with a solution of oak galls (oops — what are they?) and water

followed by application of an oak gall poultice.

Oak gall medicines were highly astringent but also possibly antibiotic. That is the hunch of pharmaceutical research today.

Photo courtesy The Alta Newsletter

Examples of tattoo designs used by California native peoples
[from a lithograph of a painting (1816) by Louis Choris – Honeyman Collection, Bancroft Library, UC Berkely]

If the teacher had not had to rush on to meet Ed Center mandates, she might have added that the **Kawaiisu** (Tehachapi area) made an eyewash from galls …that the **Diegeño** (San Diego County) treated hemorrhoids with charred galls (with a whole one or burnt powder?) …that other tribes used galls to ease intestinal discomfort or clean out the bowel, to treat boils or pustules, and as a hair restorative.

Use of oak/galls to make a black dye was far less important than as medicine, but there is some data that almost makes the mark. There seems to have been an intuitive understanding that the interaction of plant tannin and ferrous substances could produce a substance to darken vegetation (e.g. basket materials) or even human skin.

Examples from several northern California tribes include the darkening of basketry grass strands by burying them in ferrous mud and throwing a rusty nail in for good measure. The tannin + iron + dark dye was also at work when grass strands were soaked and cooked in an iron pot or rusty can, in another case.

Lastly, some tribes incorporated gall juice to make tattoos. Many California tribes did tattooing but usually with soot and bear grease rubbed into incisions. Only a few peoples used oak galls. One Pomo group made cuts, applied gall juice, and finished by rubbing poison oak in. The idea was to accentuate the lines.

There is also a curious report from **Mission San Antonio** that tattooing was done there with green gall juice. We do not know how the missionary there felt about it, but we do know that missionaries elsewhere — at **Missions San Jose** and **San Francisco de Asis** (**Dolores**) — seemed to allow it. Evidence is seen in paintings by **Louis Choris**, artist to the Russian **von Kotzebue Expedition** (1816). Choris recorded Kotzebue's visits. ✿

[*Ed. note: This is Part Two of a three-part series on galls, their historical and current uses, and on gall wasps.*]

Rare Bakersfield Cacti Project

by Lucy Clark

PLEASE JOIN US IN **WEEDING & WATERING** the rare **Bakersfield cactus** we planted at the **Nature Conservancy's Tollhouse Ranch** at Caliente on **Saturday, March 6th**. Meet at **9 am** at the **Caliente post office**, with gloves of the garden variety, masks, water and snacks, for 2 to 3 hours of work and socially distanced companionship. The Valley Oaks may need weeding also. And maybe we can get Zach to tell us about the next steps for cacti transplanting on the recently purchased **Beard Ranch** nearby.

Please email **Lucy Clark** at *lucyg391@gmail.com* if you plan to join us. ✿

Chapter ZOOM Meetings

upcoming TOPICS

March 11, 2021 — 4 pm
Presenter: **Greg Warrick,** Center for Natural Lands Management
Topic: ***Sand Ridge Wildflower Preserve National Natural Landmark***

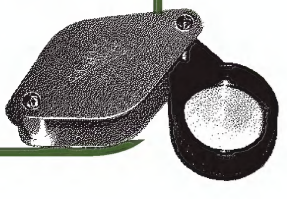
April 1, 2021 — 4 pm
Presenter: **Zach Principe**, The Nature Conservancy
Topic: ***Restoration Progress at Toll House Ranch & New Acquisitions***

April 15, 2021 — 1 pm
Presenter: **Nina House,** California Botanical Gardens
Topic: ***Vascular Flora of Manter and Salmon Creek Watersheds***

June 2021 — OPEN

REGISTER for these events;
e-mail **Paul Gipe** (*pgipe@igc.org*

Security Notes:
1. Please arrive early. Late arrivals admitted at discretion of host.
2. Use your real name, NOT a screen name, alias or name of your device.
3. Do NOT share the link to meeting with anyone.



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California Native Plant Society
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Mimulus Memo

Inside this Issue:

MARY BEAL, MOJAVE BOTANIST (PART 1)
OAK GALLS (PART II)
I KNEW THAT (EDIBLE NATIVES)
MOSSES & LICHENS: HOW LONG DO THEY LIVE?

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The Kern Chapter of the
California Native Plant Society meets
the third Thursday of each month at:
Kern County Superintendent of Schools

California Native Plant Society

City Centre, Room 1A or 1B
1300 17th Street, Bakersfield, CA.
Chapter website: kern.cnps.org

The California Native Plant Society is a non-profit organization dedicated to the conservation of California native plants and their natural habitats, and to increasing the understanding, appreciation, and horticultural use of native plants. CNPS has 31 chapters throughout the state and membership is open to all persons — professional and amateur — with an interest in California's native plants. Members have diverse interests including natural history, botany, ecology, conservation, photography, drawing, hiking and gardening. As a Kern County resident, your membership includes Fremontia, *a quarterly journal with articles on all aspects of native plants; the* Bulletin, *a statewide report of activities and schedules; and* The Mimulus Memo, *the newsletter of the Kern Chapter.*

Join CNPS or renew your membership online at www.cnps.org.
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Individual – $45
Family or Library – $75